2.3.1.1

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Coastal Protection and Restoration Division
c/o EPA Region X (ECL-117)
1200 Sixth Avenue
Seattle, Washington 98101

March 8, 2002

Wallace Reid
U.S. EPA Region 10 (ECL-115)
1200 Sixth Avenue
Seattle, WA 98101

Chip Humprey
U.S. EPA Region 10
Oregon Operations Office
811 SW 6th Avenue, 3rd Floor
Portland, OR 97204

Dear Wally and Chip,

This letter provides comments from the National Oceanic and Atmospheric Administration (NOAA) on the Portland Harbor Superfund Site - Preliminary Planning, Scoping, and Problem Formulation Document. The document was prepared by Winward Environmental, Kennedy/Jenks Consultants, and Striplin Environmental Associates.

General Comments

Overall, we would like to see more specific details included in the conceptual framework. The LWG is going through the recommended steps to develop a workplan, but they are not thinking ahead enough. To some extent, this process in an iterative one, and the LWG is trying to make it a sequential one. For example, the section on receptor selection seems incomplete and the selection of the receptors in not well justified. If the LWG would start explaining how the receptors will be assessed, it would help us all understand why the selected receptors are good ones and how collectively they will be used to assess the endpoints and pathways of concern. The more details included here, the easier the work plan development will be. The problem is partly an artifact of the preliminary nature of this document, but we feel that overall, the LWG could have done a better job of explaining their thinking.

Specific Comments

Page 2, Management Goal. As we've indicated in meetings with the LWG, we don't like this management goal. We certainly did not agree to it, so at a minimum, the text on page 1 needs to be modified to reflect that the goal is an LWG goal and not an agency or trustee

goal. Our concern is that the management goal does not include an ecological goal for the site. NOAA wants to do more than "preserve" the "natural uses" of the harbor. Our goal is to improve the chemical, and where possible, the physical quality of the habitat in the lower river. We recognize that the river is an industrial harbor, and support the goal of preserving opportunities for industrial, navigational, and recreational uses. We believe that it is possible to improve the quality of the habitat in the river while preserving the river's industrial and navigational character, and would like to see a management goal that reflects this.

Page 8, Section 3.1.2, Hydrology. This is a concise, informative discussion. Very helpful.

Page 11, first full paragraph. This section notes "*Bank fishing occurs along the Multnomah Channel outside the ISA.*" True, but bank fishing also occurs within the ISA – fishers were observed inside Swan Island by NOAA staff during a May 2001 boat trip, and bank fishing probably occurs in other areas as well.

Page16, Section 3.5 COPC Selection Process. We have a lot of concerns with this section. The second paragraph says "*Chemicals previously detected in sediments in the Lower Willamette will be used in designing the Round 1 Field Sampling. The results of the Round 1 Field Sampling as well as historic data will then be used to select the Contaminants of Potential Concern...*" The logic is a bit circular here. The LWG proposes to select chemicals for Round 1 analyses using the historic data, then combine the historic data with Round 1 results. Round 1 will not add to the knowledge base if its design is constrained by what is currently known. This approach will miss contaminants that were not measured historically, or were not measured where they occurred. Selecting chemicals to measure for Round 1 based on previous studies would be acceptable only if those previous studies assessed all potential contaminants and the data in those studies were of high quality. It is likely that the historic surveys used a variety of methods and detection limits for specific constituents. Before existing studies are used to eliminate chemicals, an evaluation should be made of the detection limits in those studies. Chemicals/data with high detection limits should be remain on the COPC list regardless of their detection frequency. Previous studies may be used for focusing future efforts, but should not be assumed to be all-inclusive. The LWG should consider past and current upland sources as well as historical data when selecting chemicals for Round 1 analysis.

Comparison to background: "*Inorganic compounds will be eliminated from the list of COPCs if no unusual elevations (above reference area concentrations) are found within the ISA.*" First, what constitutes an "unusual elevation?" Second, is the LWG proposing to remove contaminants from the analyte list or the COPC list for the risk assessment, or both? We are concerned that the LWG is inappropriately mixing risk assessment and risk management activities here. The risk assessment should assess the total risk in the lower river. If chemicals that are determined to cause risk are present at the same concentrations in the reference stations as at the site, EPA may decide that cleanup is not warranted. But that decision is a risk management decision that is made after the risk assessment is complete. Eliminating chemicals because they are also found in the reference stations will leave the risk

assessors unable to consider cumulative or synergistic effects, and may lead to inappropriate risk management decisions.

Please add more specifics about how reference areas will be selected. The reference stations will be vitally important; we should start discussing how they will be selected soon. Inorganic concentrations from reference areas should be screened against concentrations of concern (e.g. ERLs and/or TELS) to confirm that reference concentrations are appropriate.

Frequency of Detection: This frequency of detection method assumes: that appropriate detection limits were used in the various historic sampling events; that detection limits were similar across studies; that data were evenly distributed spatially; that similar numbers of samples were collected for all chemicals; that previous sampling efforts included all the chemicals of concern; and that sampling has occurred in the habitats of concern. Given the varying purposes and quality of the previous studies, we do not think this is a good approach. The LWG needs to summarize the historic data with regard to numbers of samples per contaminant, the area sampled and its distribution for that contaminant, and the detection limits. Only COPCs that have appropriate detection limits and were sampled evenly and thoroughly throughout the study area would be candidates for elimination using this method. All other chemicals should be kept as COPCs, at least for Round 1 sampling.

This elimination process will not work well for bioaccumulative contaminants that may have low concentrations in sediment, but still be a problem to receptors.

The analysis also needs to include a spatial component. Using a 5% detection frequency could result in eliminating a cluster of samples indicating a contaminant "hot spot" that were too few in number to meet the acceptance threshold.

Comparison to Benchmarks. "*If the maximum concentration is above the risk-based screening level, the concentration will be retained as a COPC.*" Are we talking about media here (the analyte list), or the risk assessments (COPCs to carry through the assessment)? This is confusing, here and in the rest of this entire section. A series of decision trees might help clear this up; this text is unclear. "*For ecological risk, COPCs detected at greater than 5% frequency will be selected based on a review of the toxicological effects for each assessment endpoint.*" Assessment endpoints are defined later in the document as survival, growth, and reproduction of bird, mammal, and fish populations, and benthic invertebrate communities but no specific effects thresholds are presented, and no information is presented on how subtle, sublethal effects will be addressed. The results of the COPC selection review will be presented in the workplan. We request that the results be supported with a detailed discussion of the decision process for each COPC, identifying thresholds, literature citations, etc.

Identification of Bioaccumulative Compounds. "*If potentially bioaccumulative compounds are not found in tissue they will be eliminated as COPCs.*" What tissue data are available for this evaluation? What species will be included in the tissue data collection effort? Are tissue contaminant data available for benthic macroinvertebrates? What is the

distribution of samples for tissue data? Without knowledge of this basic information, it is not possible to conclude that this is a reasonable approach for selecting/eliminating COPCs. We do not believe that existing tissue data from the ISA are sufficient to support this process. We recommend that any constituent that has made it to this step in the process be included as a COPC if the log K_{ow} exceeds 3.5. Further tissue testing will determine whether the constituent should be eliminated. Also, what source will be used for the K_{ow} numbers?

Page 20. Are there no habitats supporting, or capable of supporting, aquatic plants in the ISA? Perhaps the substrate is not suitable for plants in many places, but we would hesitate to remove plants entirely from the risk assessment if there are areas capable of supporting aquatic vegetation.

Page 20. Assessment endpoints are selected at the community and population levels. OSWER Directive 9285.7-28P, Issuance of Final Guidance: Ecological Risk Assessment and Risk Management Principles for Superfund Sites (10/7/99) states: "Superfund remedial actions generally should not be designed to protect organisms on an individual basis (the exception being designated protected status resources, such as listed or candidate threatened and endangered species or treaty-protected species that could be exposed to site releases), but to protect local populations and communities of biota." There are five salmonid ESUs that occur in the ISA that are listed as threatened under the Endangered Species Act; these and other listed species (i.e., bald eagles) should be assessed at the individual level.

Page 20, bottom of page. "*...the habitat within the ISA is not conducive to an abundant amphibian or reptile...*" What population level is defined as "abundant?" Is there guidance on the level of abundance necessary to evaluate risk? What data were relied on to determine that the habitat within the ISA is not conducive for amphibian or reptile populations?

Page 21. "*Measures of exposure include concentrations of COPCs in sediments and biota.*" How will readily metabolized or non bioaccumulative COPCs be evaluated? Why is surface water ignored?

Page 22, Measures of Ecological Effects. How will measures of ecological effects be measured? Directly? Through comparison to literature values? Does "community-level measures" mean measures of community composition and abundance and if so, will reference stations be used to compare to the community structure in the ISA?

Page 22, Measures of Ecosystem and Receptor Characteristics. "*... whether exposures are of sufficient magnitude to result in unacceptable risk*" How will "sufficient magnitude" be determined?

Page 23, Benthic Habitats. There are some natural shorelines / beaches within the ISA. Defining various habitats will be important in the injury assessment as well as the risk assessment. Physical factors such as depth and substrate type are obviously critical, but use of the various habitats by fish and birds needs also needs to be considered when defining habitat types.

Page 26, Third paragraph. Although it is acknowledged that the sampling results from ODFW's 2000 habitat studies are preliminary, it should be recognized that the differences in numbers of juvenile chinook salmon captured at various sites may be more related to gear selection (beach seines) than habitat preference.

Page 29, First full paragraph. "*Amphibians and reptiles are rarely found in the ISA.*" Please provide a reference for this statement.

Page 31, Identification of Representative Receptors. Overall, NOAA thinks that the list of receptors is too short and that at least one additional fish will be needed. Also, much more detail is needed in this section. What direct and indirect pathways were considered? How were the organisms grouped and are the groupings sufficient to cover the variety of receptors present in the ISA? How did sensitive life stages figure into the selection of receptors? How did the type of contaminants in the ISA affect the choice of receptors? We suggest that a meeting be held with the risk assessors to focus specifically on the question of receptor selection, so these and other issues can be fully discussed. We also think it is difficult to select the final receptor list without working through the assessment endpoints and measures. This is one area where an iterative process is the only way to ensure the all the bases have been covered.

Page 32, Piscivores. "*A management goal for this risk assessment is to protect the recreational fishery in the ISA.*" Where is this management goal explicitly stated in this document? It is not in Section 4.1.1 where it belongs. We do not agree with choosing a species based on its recreational value. The goal is not to merely select "a representative species," but to select "worst case scenario" species that are the most sensitive and most highly exposed among their group. We don't disagree with the selection of smallmouth bass, but we would like to know why it was selected over the northern pikeminnow. It is noted that the pikeminnow is found in all habitats, while the smallmouth bass is most common near developed sites (rip-rap areas). Will use of a species associated with a particular habitat type provide an accurate representation of the overall effect on piscivorous fishes? Are there differences in the uptake of contaminants between the species? Are they equally sensitive to contaminants? These issues should be addressed in the selection of a receptor.

Page 32 states "*benthic invertebrates will be assessed as a community.*" The benthic community is included and reviewed in the potential ecological receptor section, but no representative receptor is selected. How will the benthic community be assessed? The benthic community is a vital link the food chain, and NOAA supports the assessment of the benthic community as resource. However, we don't agree that crayfish and shellfish should be lumped in with insects, worms and other benthic organisms. Page 24 states that "*crayfish may be locally abundant and an important food resource.*" Local crayfish and/or shellfish populations should be considered separately, because people eat them, because they don't have the same ability to metabolize PAHs as fish, and because they are uniquely sensitive to TBT, a contaminant of concern in shipyards and harbors. The infauna have not been well-studied in the lower main stem, so we may need to wait until the Round 1 sampling is done

and we have a better sense of what is out there before defining how benthic organisms will be addressed in the final risk assessment.

Page 33, Insectivores. Juvenile chinook salmon need to be included as a receptor because of their special resource value. However, they do not necessarily represent resident insectivorous species. A sensitive resident insectivorous fish should be assessed, not just a juvenile of smallmouth bass and sturgeon. An important pathway for bioaccumulative contaminants is directly to the eggs. This pathway is lost if a life-stage from another receptor is used.

Pages 33-34, Omnivores. Sturgeon should be retained as a receptor because of their importance as a recreational fish but it is questionable if they represent resident bottom-feeding omnivores. Sturgeon are slow to mature but exhibit fairly rapid growth during their first few years of life. In contrast, largescale suckers (resident omnivore) grow slowly and steadily to maturity (Scott and Crossman, 1973). Will representation of resident omnivores be limited to sturgeon < 50 cm in length? How does the rapid growth of sturgeon, compared with other species, affect its selection as a receptor?

Page 34, Partial paragraph at top of page. "*White sturgeons are known to spawn in the vicinity of the ISA so egg and larval stages may be exposed.*" Good point. It is unclear how the risk to egg and larval stages of sturgeon (and other resident species that spawn in the ISA) will be evaluated.

Page 34, Partial and first full paragraphs at top of page. What is the significance of the discussion on tolerance to pollution with regard to the selection of receptors? White sturgeon is considered intolerant to pollution, sculpin and largescale sucker are considered tolerant, yet all three are listed as abundant in the ISP.

Page 36, Omnivores. The spotted sandpiper may be an appropriate choice because of its level of sediment ingestion but how will the fact that there is limited foraging habitat for sandpipers in the ISP be accounted for? Sandpipers forage on shorelines. Given that factors that modify exposure will be considered in determining if exposures are sufficient to result in unacceptable risk (p. 22), how will the relative scarcity of undeveloped shorelines in the ISP factor into the assessment of risk to sandpipers?

Page 38, section 4.5.2. Rationale for Exposure Pathway Designations by Receptor: Aquatic Receptors. This is a significant section in that conclusions are drawn that will influence the development of the ecological risk assessment process. We are troubled that determinations to not proceed with further evaluation of particular pathways are based on unsubstantiated assumptions or lack of data. This is intended to be a ***risk*** (emphasis added) assessment. If there is some potential for exposure, but no data, the conclusion should be significance unknown, and the pathway investigated further, until sufficient information is developed to make a determination.

Page 38, Wild Juvenile chinook salmon. Direct sediment contact is considered incomplete and insignificant. Is there data to support the general statement that juvenile chinook salmon do not come into contact with sediment for a significant period of time? Juvenile chinook have been shown to occur in the area over a long period of time (Figure 4.1). Studies related to activity patterns of juvenile chinook salmon in freshwater (Bradford and Higgins 2001) and in estuaries (Levy and Levings 1978) indicate that fish activity is nocturnal or crepuscular with some fish remaining concealed in or near the substrate in cover and interstitial refuges until dusk. Ellis (1999) found juvenile chinook overwintering along riprapped shorelines in the Columbia River. Hillman et al. (1989) found that juvenile chinook salmon and steelhead rested on the substrate in shallow quiescent stream areas for nighttime habitat. There do not appear to be data specific to the lower Willamette River that report on the use of specific habitats. However, unless there is site-specific evidence to the contrary, the assumption should be that juvenile salmon, while hiding in or near the substrate, come into direct contact with the sediment for significant periods of time. This pathway should be considered complete and significance unknown.

Sediment ingestion is considered complete and insignificant based on the assumption that fish do not come into contact with sediment and a communication that fish do not ingest an appreciable amount of sediment. We believe that the evidence supports that fish do come into contact with sediment. Evaluation of concentrations of aromatic hydrocarbons in stomachs of juvenile chinook salmon in 1989 and 1990 (Varanasi et al. 1993) found levels in fish in the Duwamish Waterway higher than could be explained through consumption of food, indicating that the fish may have ingested sediments. This pathway should be considered complete and significance unknown.

Direct water contact is considered complete and insignificant. There is no evidence that areas with high sediment concentrations do not also have elevated water concentrations, especially at the sediment-water interface. The osmotic balance in fresh water results in water constantly entering fish through its gills. No data are present to dismiss water contact as an exposure pathway, it should be considered complete and significance unknown.

Page 39, Smallmouth bass. Direct water contact -- the finding should be complete and significance unknown, based on the same reasoning as presented for juvenile chinook salmon. Other ingestion -- this is considered complete and insignificant because the overall contribution to their diet is assumed to be small. Are there data to support this assumption? If not, the finding should be significance unknown.

Page 40, White sturgeon. Direct water contact - the finding should be complete and significance unknown, based on the same reasoning as presented for juvenile chinook salmon.

Page 41, Benthic community. Direct water contact -- change to complete and significant. Benthic filter-feeding organisms in direct contact with sediment may still have water as a significant source for dissolved contaminant uptake.

We have raised a lot of questions in our comments. Some of these questions may not be answered until the workplan is developed, and some may not be answered until after this summer's field work. But many of them can and should be discussed now. We look forward to working with EPA and the LWG to refine the conceptual model and develop assessment endpoints and measures.

If you have any questions about NOAA's comments, please do not hesitate to call Nick Iadanza or me.

Sincerely,

Helen E. Hillman

Helen Hillman
Coastal Resource Coordinator

cc: Alyce Fritz, NOAA / NOS / CPRD (file copy)
Nancy Beckvar, NOAA / NOS / CPRD (email only)
Katherine Pease, NOAA / GCNR
Nick Iadanza, NOAA / NOS / DAC
Joe Goulet, EPA (email only)
Dana Davoli, EPA (email only)
Julie Wroble, EPA (email only)
Rene Fuentes, EPA (email only)
Jeremy Buck, USFWS
Kathleen Feehan, Grand Ronde (email only)
Pam Bridgen, Grand Ronde (email only)
Paul Ward, Yakama (email only)
Bobby Brunoe, Warm Springs (email only)
Audie Huber, Umatilla (email only)
Patti Howard, CRITFC for the Nez Perce (email only)
Tom Downey, Siletz (email only)
Eric Blischke, Oregon DEQ (email only)
Rick Kepler, ODFW (email only)

References

Bradford, M.J. and P.S. Higgins. 2001. Habitat-, season-, and size-specific variation in diel activity patterns of juvenile chinook salmon and steelhead trout. Can. J. Fish. and Aq. Sci. 58(2) pp 365-374)

Ellis, R.H. 1999. Seasonal Fish Use of Shallow Water Habitats in the Lower Columbia River West Hayden Island (RM 102) to Sandy River Delta (RM 125). Report prepared for U.S. Army Corps of Engineers, Portland, OR.

Hillman, T.W., Chapman, D.W., and J.S. Griffith. 1989, Seasonal Habitat Use and Behavioral Interaction of Juvenile Chinook Salmon and Steelhead. II: Nighttime Habitat Selection. In: Summer and Winter Ecology of Juvenile Chinook Salmon and Steelhead Trout in the Wenatchee River, Washington. Final Report to Chelan County PUD, Washington.

Levy. D.A. and C.D. Levings. 1978. A description of the fish community of the Squamish River estuary, British Columbia: relative abundance, seasonal changes, and feeding habits of salmonids. Manuscr. Rep. Mar. Serv. (Can.) (No. 1475). (Abstract only)

Scott, W.B. and E.J. Crossman. 1973. Freshwater Fishes of Canada. Bulletin 184. Fisheries Research Board of Canada, Ottawa.

Varanasi, U., Casillas, E., Arkoosh, M.R., Misitano, D.W., Stein, J.E., Hom, T., Collier, T.K., Brown, D.W. 1993. Contaminant exposure and associated biochemical effects in outmigrant juvenile chinook salmon from urban and non-urban estuaries of Puget Sound, Washington, NOAA, Seattle, WA.